Recovery Plan Revision for the Endangered Triangular Kidneyshell (*Ptychobranchus greenii*) https://ecos.fws.gov/docs/recovery_plan/001117.pdf

Original Approved: November 17, 2000
Original Prepared by: Jackson, Mississippi U.S. Fish and Wildlife Service and Mobile River Basin Coalition Committee

Amendment 1

We have identified the need to amend recovery criteria for the triangular kidneyshell (*Ptychobranchus greenii*). This proposed modification will be published as an addendum that supplements the recovery plan by adding delisting criteria which were not developed at the time the initial recovery plan was completed. The addendum will supplement the Recovery Objective and Criteria section of the *Recovery Plan for Mobile River Basin Aquatic Ecosystem* (USFWS 2000). Recovery plans are a non-regulatory document that provides guidance on how best to help recover species.

For
U.S. Fish and Wildlife Service
Atlanta, Georgia

Approved: Franklin Tunnell III
Acting **Regional Director, U.S. Fish and Wildlife Service**

Date: 9/26/19

METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT

The proposed amendments to the recovery criteria were developed using the most recent and best available information for the species. The lead biologist gathered the information and notified conservation partners of the U.S. Fish and Wildlife Service's (Service) process to complete this amendment. Ultimately, biologists and managers in the Alabama Ecological Services Field Office developed the amended recovery criteria for the triangular kidneyshell.

ADEQUACY OF RECOVERY CRITERIA

Section 4(f)(1)(B)(ii) of the Endangered Species Act (Act) requires that each recovery plan shall incorporate, to the maximum extent practicable, "objective, measurable criteria which, when met, would result in a determination...that the species be removed from the list." Legal challenges to recovery plans (see Fund for Animals v. Babbitt, 903 F. Supp. 96 (D.D.C. 1995)) and a Government Accountability Audit (GAO 2006) also have affirmed the need to frame recovery criteria in terms of threats assessed under the five listing factors.

Existing Recovery Criteria

The current recovery plan (https://ecos.fws.gov/docs/recovery_plan/001117.pdf) (USFWS 2000) does not provide recovery criteria, but it does outline recovery objectives, see page 60.

Synthesis

The Service listed the triangular kidneyshell as endangered in 1993 due to habitat modification, sedimentation, eutrophication, and other forms of water quality degradation (58 FR 14339). The Service designated critical habitat for this species in 2004 (69 FR 40084). Currently, the species is threatened by habitat modification, sedimentation, degradation of water quality, impoundment by dams, operation of lock and dams, redirection of flow (Factor A); lack of adequate enforcement of existing Federal or State regulations prohibiting take (Factor D); and fragmentation of populations leading to genetic diversity loss (Factor E) (58 FR 14330).

The triangular kidneyshell was historically known from the Alabama, Tombigbee, Black Warrior, Cahaba, and Coosa rivers and their tributaries in Alabama, Georgia and Tennessee. Streams with extant occurrences include the following sub-basins: Tombigbee, Black Warrior, Cahaba, and Coosa rivers. For specific location information, refer to the most recent 5-year review (https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=F037).

For the purpose of this recovery plan amendment the U.S. Fish and Wildlife Service considers that the taxon *Ptychobranchus greenii* as occurring in the Tombigbee, Black Warrior, Cahaba, and Coosa River basins, per the original listing (58 FR 14339). Williams *et al.* (2008, 2017) separated the populations in the Tombigbee and Black Warrior River systems as *Ptychobranchus greenii*; and, those from the Cahaba and Coosa River systems as *P. foremanianus*, based primarily on the presence of fine green rays on the shells of *P. foremanianus*, whereas *P. greenii*'s shell was rayless (Williams, *et al.* 2008). *Ptychobranchus*

females with different appearing conglutinates (fish eggs or dipteran larvae) have been observed in both the Tombigbee/Black Warrior and the Cahaba/Coosa systems. However, in Roe's (2013) phylogenetic analysis of the genus Ptychobranchus, he was unable to resolve whether the geographical populations in the Mobile River Basin represented distinct species.We believe additional comparative studies, including anatomy, life history, conglutinate morphology and further genetic analyses are necessary to determine if there are multiple *Ptychobranchus* species occurring in these river systems.

The triangular kidneyshell is currently stable and not believed to have lost any known populations since the time of listing. The most robust population is the Cahaba River (Jefferson/Bibb/Shelby Counties, Alabama), where densities have been found up to 0.25 individuals/m^2 (P. Johnson pers. comm. 2018). The Sipsey Fork population was believed to be healthy until the 2000 drought, when the pre-drought densities were documented at 0.88 individuals/m^2, but post-drought were measured at 0.18 individuals/m^2 (Haag and Warren 2008).

The primary cause of curtailment of range and fragmentation of habitat for this species is construction of dams and impoundment on large reaches of major river channels. These conditions continue to affect the species, although flow improvements have been made, or are planned below some Coosa River dams. All populations remain susceptible to stochastic and chronic events (e.g., spills, drought and/or runoff). As such, we propose the following recovery criteria to ensure that triangular kidneyshell has adequate representation and redundancy so that stochastic losses of individual populations no longer threaten the species with extinction.

AMENDED RECOVERY CRITERIA

Recovery criteria serve as objective, measurable guidelines to assist in determining when an endangered species has recovered to the point that it may be delisted and the protections afforded by the Act are no longer necessary. Delisting is the removal of a species from the Federal Lists of Endangered and Threatened Wildlife and Plants. The term "endangered species" means any species (species, sub-species, or DPS) which is in danger of extinction throughout all or a significant portion of its range. The term "threatened species" means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Revisions to the Lists, including delisting or downlisting a species, must reflect determinations made in accordance with sections 4(a)(1) and 4(b) of the Act. Section 4(a)(1) requires that the Secretary determine whether a species is an endangered species or threatened species (or not)

because of threats to the species. Section 4(b) of the Act requires that the determination be made "solely on the basis of the best scientific and commercial data available." Thus, while recovery plans provide important guidance to the Service, States, and other partners on methods of minimizing threats to listed species and measurable objectives against which to measure progress towards recovery, they are guidance and not regulatory documents.

Recovery criteria should help indicate when we would anticipate that an analysis of the species' status under section 4(a)(1) would result in a determination that the species is no longer an endangered species or threatened species. A decision to revise the status of or remove a species from the Federal Lists of Endangered and Threatened Wildlife and Plants, however, is ultimately based on an analysis of the best scientific and commercial data then available, regardless of whether that information differs from the recovery plan. When changing the status of a species, we first propose the action in the *Federal Register* to seek public comment and peer review, followed by a final decision announced in the *Federal Register*.

Herein, we provide delisting criteria for the Recovery Plan (USFWS 2000) as the plan did not include measurable delisting criteria at the time of publication.

Amended Recovery Criteria

We are providing recovery criteria for the triangular kidneyshell recovery plan (USFWS 2000). The below recovery criteria describes a recovered species, or a species that should be considered for removal from the Federal Lists of Endangered and Threatened Wildlife and Plants (50 CFR 17).

1. At least ten (10) populations exhibit a stable or increasing trend, natural recruitment, and multiple age classes (Factors A and E).

2. At least two (2) populations (as defined in criteria 1) exists in each of the four (4) currently occupied sub-basins: (Coosa, Cahaba, Black Warrior, and Tombigbee) (as defined in Criterion 1) (Factors A and E).

3. Threats have been addressed and/or managed to the extent that the species will be viable into the foreseeable future (Factors A, D, and E).

Justification for Amended Recovery Criteria

Criterion 1: Populations that exhibit a stable or increasing trend, natural recruitment, and multiple age classes demonstrate that the population is secure and will be resilient to habitat destruction and stochastic events (Factors A and E). For the triangular kidneyshell, it is believed

that 10 populations exhibiting these traits provides sufficient redundancy to ensure the species will no longer require protection under the Act.

Criterion 2: To ensure that the species will not become threatened with extinction in the foreseeable future a sufficient number of populations should be distributed throughout its historical range, therefore, we believe it is necessary for the species to occur in Coosa, Cahaba, Black Warrior, and Tombigbee sub-basins as described in Criterion 2. Expanding the species' range into historically occupied river reaches, and in a variety of stream sizes, will increase its resiliency, representation, and redundancy, and reduce threats due to habitat destruction and stochastic events (Factors A and E).

Criterion 3: Abatement of threats to the triangular kidneyshell will allow populations to become stable and contribute to the viability of the species. The triangular kidneyshell is only known to persist in free-flowing streams. Current State and Federal regulations regarding pollutants are assumed to be protective of native aquatic species; however, some native species may have lower thresholds to some pollutants than the test organisms commonly used in developing the criteria. Eliminating significant sources of sedimentation, avoiding channelization and further dam construction, and adhering to good land management practices that minimize non-point source pollution in these sub-basins, will contribute to the conservation of the species into the foreseeable future (Factors A, D, and E).

Rationale for Amended Recovery Criteria

The Service adopted analysis of Resiliency, Redundancy, and Representation (3Rs) as a means to determine species viability in regards to listing and other regulatory decisions. The amended criteria follow a similar analysis process. All criteria must address and meet the species needs to accomplish the standards under the 3Rs.

Resiliency (as defined in Smith *et al.*, 2018) is met through Criterion 1 and the rationale l listed above. The Service believes the establishment of a stable or increasing trend in population numbers, and determining successful recruitment through multiple age classes, the triangular kidneyshell will withstand any stochastic disturbance that may occur into the future.

Redundancy (as defined in Smith *et al.*, 2018) is addressed in Criteria 1 and 2. The requirement of 10 resilient populations across multiple sub-basins is necessary to avoid extinction following any unforeseen catastrophic event. Each of the sub-basins possess unique land characteristics, annual climate variations, and stream morphology. These variances will shield populations across multiple possible catastrophic events. Habitats/water quality in historical river basins must be adequate for populations to be sustained or improved with augmentation to the degree

that reintroducing/augmenting the species is successful.

Representation (as defined in Smith *et al.*, 2018) will be accomplished when all criteria listed above are accomplished. The species will be distributed across multiple states, physiographic provinces, and stream orders. This should allow for preservation of genetic exchange into the future between two or more populations, distribution across multiple natural variances in habitat types, and allow for future adaptations to changing environmental conditions.

Specifically, the stability of 10 populations reduces the probability of extinction. Due to the large number of threats to each population that cannot be mitigated, the only way to ensure that the species will not become threatened with extinction in the foreseeable future is to create a sufficient number of populations distributed throughout its historical range, such that the loss of any one population due to unforeseen circumstances does not limit the continued existence of the species.

We suggest the maintenance and improvement of the existing populations is continued in an effort to establish or maintain resiliency. This, along with the establishment of additional populations, will demonstrate that the combination of threats acknowledged in the initial listing are reduced to a degree that is manageable, and that resilient populations can be sustained despite remaining threats. Additionally, the habitat improvements, spatial distributions of populations and adequate genetic variation in each population should help ensure future stability of this species to preclude relisting.

LITERATURE CITED

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